

APPARATUS AND METHODS FOR ELECTROCHEMICAL PROCESSING OF MICROELECTRONIC WORKPIECES

ABSTRACT

An apparatus and method for electrochemical processing of microelectronic workpieces in a reaction vessel. In one embodiment, the reaction vessel includes: an outer container having an outer wall; a distributor coupled to the outer container, the distributor having a first outlet configured to introduce a primary flow into the outer container and at least one second outlet configured to introduce a secondary flow into the outer container separate from the primary flow; a primary flow guide in the outer container coupled to the distributor to receive the primary flow from the first outlet and direct it to a workpiece processing site; a dielectric field shaping unit in the outer container coupled to the distributor to receive the secondary flow from the second outlet, the field shaping unit being configured to contain the secondary flow separate from the primary flow through at least a portion of the outer container, and the field shaping unit having at least one electrode compartment through which the secondary flow can pass while the secondary flow is separate from the primary flow; an electrode in the electrode compartment; and an interface member carried by the field shaping unit downstream from the electrode, the interface member being in fluid communication with the secondary flow in the electrode compartment, and the interface member being configured to prevent selected matter of the secondary flow from passing to the primary flow.